RIVERSIDE HIGHLAND WATER COMPANY

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March 7, 2006

Brad Newton, Ph. D.
SAIC Engineering, Inc.
525 Anacapa Street
Santa Barbara, CA 93101

Re: Riverside Highland Water Company Urban Water Management Plan

Dear Mr. Newton:

Enclosed you will find portions of the RHWC Urban Water Management Plan that you requested last week.

As I had mentioned, I cannot distribute the entire plan, however the information you need should be included in the information provided.

Let me know if you need anything else.

Thank you,

Don Hough

SECTION V

HISTORIC AND PROJECTED WATER SOURCE PRODUCTION AND WATER USAGE

5.01 GENERAL

Water for domestic and irrigation is produced from three basins: San Bernardino Basin, Rialto-Colton Basin and the Riverside Basin. The production of water production for irrigation use is rapidly being reduced due to the removal of citrus groves for urban development. The irrigation demand is being converted to domestic production following periods of development.

5.02 PAST SIX-YEAR WATER PRODUCTION

The past six years (1999 through 2004) of water production for domestic use and irrigation use are shown in Table 5-1.

Table 5-1

Past Six Years of Water Production
(All quantities shown in acre-feet)

Year	1999	2000	2001	2002	2003	2004
Domestic	3,921	3,994	3,816	4,772	3,922	4,044
Irrigation	2,120	1,176	839	1,022	708	501
Total	6,041	5,170	4,655	5,199	4,630	4,454

The reduction of irrigation water may be seen in the above Table 5-1. When comparing this with the population projections in Section II, the housing developments under construction will increase the domestic production.

5.03 WATER USE

All water in the domestic water system is sold to customers through meters. In April 2005, a survey of the categories of customers was made and the following data obtained:

Table 5-2

Number of Water Connections by Category

Type/Category of Customer	No. Metered Services
Residential	3,711
Commercial	82
Industrial	8
Agricultural (Agricultural and Residential)	18
Other Water Systems	0
TOTAL ACTIVE CONNECTIONS	3,819

At the time of the survey, there was one (1) inactive water service.

5.04 EXCHANGES AND TRANSFER OF WATER

The Riverside Highland Water Company has "Emergency Inter-Ties " with the City of San Bernardino, City of Colton and the City of Rialto. In addition, the City of Riverside owns shares of stock in the Riverside Highland Water Company and obtains their share of water by "In-Lieu-Pumping". The following Table 5-3 shows the quantity of water delivered to the agencies requesting water and the amounts pumped by the City of Riverside. RHWC has the right to terminate this inter-tie service if they need the water and RHWC can request water from the other agency if it is needed.

The City of San Bernardino has not requested any water and the inter-tie is in place if the City or RHWC need water. The City of Colton has had to shut down some of its domestic water production wells since toxic substances are showing up in the wells in excess of State Standards. Water has been delivered to the City since 2002. The City of Rialto has an inter-tie in-place since 2004 for the same reasons as the City of Colton. Rialto first started taking water into their domestic water system in August 2005.

Table 5-3

Domestic Water Delivered to the City of Colton
(Quantities Shown in Acre-Feet)

Year	Quantity
2002	828
2003	235
2004	116

Table 5-4

In-Lieu Pumping by the City of Riverside
(Quantities Shown in Acre-Feet)

Year	Quantity
2003	1,300
2004	300

Three wells, FW-2, FW-5 and FW-18 have been dedicated to pumping water from the Bunker Hill Basin (San Bernardino Basin) to lower the groundwater to a level where it will not flood the basements of commercial structures in the basin. This pumping is done in cooperation with the San Bernardino Valley Municipal Water District Groundwater Reduction Program. Water Pumped in this program is not assessed against the RHWC water rights in the San Bernardino basin.

Table 5-5

Groundwater Reduction Program Pumping
(Quantities Shown in Acre-Feet)

Well	Quantity by Year					
	1999	2000	2001	2002	2003	2004
FW-2	787.3	188.4	75.9	423.5	0.3	0.1
FW-5	154.1	6.3	63.6	514.0	0.5	0.1
FW-18	1,210.8	373.4	120.8	971.7	0.2	0.2
TOTAL	2,152.2	568.1	260.3	1,909.2	1.0	0.4

5.05 IMPORTED WATER

RHWC has entered into an agreement with the San Bernardino Valley Municipal Water District (SBVMWD Legal Document 1487, approved January 18, 1990) for a maximum flow rate of 1,000 gallons per minute from the Districts' "Base Line Feeder" project. The maximum quantity RHWC can receive in any calendar year is 1,000 acre-feet from this pipeline. Water obtained through this agreement will be assessed against the Company's water right in the San Bernardino Basin. This agreement was made with the understanding that it is a standby agreement and the water delivery is to be made only at the Company's request.

A copy of Legal Document No. 1487 is included as Appendix "B", herein.

5.06 WATER PRODUCTION BY GROUNDWATER BASIN

The Riverside Highland Water Company extracts water from three separate basins: The San Bernardino Basin, Colton Basin and the Riverside Basin. The San Bernardino Basin extractions are from two (2) sub-basins: the Lytle Creek Basin and the Bunker Hill Basin. The Riverside Basin is separated into two areas, based on drainage to the Santa Ana River. These separated basins are called the Riverside North Basin and the Riverside South Basins.

Table 5-6

Year 2004 Water Production
By
Well and Groundwater Basin

	San Bernardino Basin			Riverside Basin	
Well	**Lytle Creek**	**Bunker Hill**	**Rialto-Colton**	**Riv. North**	**Riv. South**
LC-1	0.0	-	-	-	-
LC-8	0.0	-	-	-	-
LC-10	1,454.1	-	-	-	-
FW-2	-	0.1*	-	-	-
FW-5	-	0.1*	-	-	-
FW-18	-	0.2*	-	-	-
CR-4A	-	-	-	-	-
LV-3	-	-	-	48.7	-
RN-6	-	-	-	312.5	-
RN-7	-	-	-	971.6	-
RN-17	-	-	-	447.9	-
RN-20	-	-	-	1,010.8	-
RN-21	-	-	-	-	243.6
RN-22	-	-	-	-	63.8
Total	**1,454.1**	**0.4**	**-0-**	**2,791.5**	**307.4**

Total water pumped during calendar year 2004 = 4,553.4 acre-feet.
When subtracting basin pump out water total to customers is 4,553.0 acre-feet.

The RHWC has 13 operating wells of which eight (8) extracts water for domestic water distribution. Two (2) wells are dedicated at this time for irrigation purposes. The irrigation wells have a nitrate concentration in excess of drinking water standards are pumped into an irrigation water system, which is separated from the domestic system. Three (3) wells are dedicated to basin pump-out to reduce the groundwater elevation to where water will not encroach into existing structures.

Location of the wells are shown on Exhibit 5-1

5.07 PROJECTED WATER REQUIREMENTS

During the past six years (1999 through 2004) total annual water production has decreased steadily from 6,041 acre-feet in 1999 to 4,454 acre-feet in 2004. The domestic water production has increased while the irrigation extractions have declined. This can be seen in Table 5-1, Past Five Years of Water Production, page 12 herein. The decline in irrigation water production is caused by the reduction in irrigated acreage created by urbanization in the agricultural areas within the Water Company. There are large acreages currently under development where irrigation has stopped and domestic supply will begin. This is reflected in the population projections shown in Table 2-3, Population Projections, Riverside Highland Water Company, page 4 herein.

Irrigation requirements will not disappear in the future. Riverside Highland Water Company has wells (No. RN-21 and RN-22) which do not meet the standards for drinking water (high nitrates) and are dedicated to producing irrigation water for parks, landscaped and open space. It is estimated that approximately 1,000 acre-feet of this water will be extracted annually in the future for these purposes. The irrigation of water is planned primarily in areas where the geologic conditions are that the lands being irrigated are non-water bearing. In this manner the water being extracted will remove nitrates from the groundwater and placed in areas where they will not percolate back to the groundwater. It is planned that this extraction of the high nitrate water will help to return these waters back to drinking water standards as they once were.

Based on historic population estimates and water production, that an average of 0.27 acre-foot of water per person will be required in the future for domestic production. To this domestic amount, we estimate that 1,000 acre-feet of water will be used in the year 2010. A lesser amount of irrigation water will be required in the year 2005 because of construction activity.

Table 5-7

Projected Water Requirements
For
Riverside Highland Water Company
(Projected Water Production Shown in Acre-Feet)

Year	Population	Water Requirements		
		Domestic	Irrigation	Total
2005	14,270	4,138	500	4,638
2010	23,614	6,376	700	7,076
2015	24,322	6,567	800	7,367
2020	25,052	6,764	900	7,664
2025	25,804	6,976	1,000	7,996

5.08 CURRENT WATER PRODUCTION CAPABILITIES

Riverside Highland Water Company currently has thirteen (13) wells capable of producing water. Two of these wells, RN-21 and RN-22 are dedicated to provide irrigation water due to high nitrate concentrations. Three wells, FW-2, FW-5 and FW-18 are being used for the groundwater reduction program of the San Bernardino Valley Municipal Water District. These three wells can be converted to domestic water production if required. To assess the water production capabilities for domestic water, all wells with the exception of the irrigation wells RN-21 and RN-22 will be considered.

The following Table 5-8 shows the water production capabilities at the end of the calendar year 2004 production period. The data is from recent Southern California Edison, Hydraulic Test Results on the well and pumping equipment:

Table 5-8

Pumping Capabilities of Riverside Highland Water Company Operating Water Wells
(Water Production Shown in Gallons Per Minute)

Well	Use	Rate of Flow	Pump Efficiency
LC-1	Dom	1,000	N/A
LC-8	Dom	1,000	N/A
LC-10	Dom	1,943	60.6%
FW-2	Dom	1,122	N/A
FW-5	Dom	2,381	61.6%
FW-18	Dom	1,130	N/A
CR-4A		Non-Operating	--
LV-3	Dom	1,510	81.5%
RN-6	Dom	2,067	80.8%
RN-7	Dom	1,406	70.1%
RN-17	Dom	1,901	69.7%
RN-20	Dom	1,010	73.0%
RN-21	Irr	1,390	67.0%
RN-22	Irr	1,042	77.7%

N/A-Represents not available
Dom- Represents domestic water production
Irr- Represents irrigation water production

Domestic water production from existing sources will provide 16,470 gallons per minute of production. Under current pumping policies for pumping 18 hours daily, a total of 17,787,600 gallons of water per day can be produced.

Irrigation water production from existing sources will provide 2,432 gallons per minute of production. Under current pumping policies for pumping 18 hours daily, a total of 2,626,560 gallons of water per day will be produced.

When considering the domestic water on a maximum day of the maximum month will require 518 gallons per day per person, the current production capabilities would serve a population of 34,339 people. Because the domestic water distribution system is separated into pressure zones, this would require many transfers of water. To make the water system reliable, additional wells will be constructed to provide water production to proper locations and required redundancy within the domestic water system.

Wells presently considered for additions to the domestic water system are as follows:

Table 5-9

Proposed
Well Additions to Domestic Water System

Well	Year of Installation
SMR	2006
FW-5 *	2006
Lytle Creek	2008
FW-2 *	2010
FW-18 *	2012
CR	2015

* Wells existing that will be converted to domestic use and are included in the current production capacity.

Each well is expected to have a production capacity of 1,500 to 2,500 gallons per minute. The actual number of wells to be added to the system can vary depending upon actual need. Since there is no restriction on constructing wells in the basins that Riverside Highland Water Company extracts water, the dated of installation are subject to change, again depending upon needs.

5.09 ALTERNATE WATER SUPPLIES

Water supplies, in addition to the water sources of the Riverside Highland Water Company, have been discussed earlier in this Plan. These sources include:

1. Base Line Feeder, San Bernardino Valley Municipal Water District; 1,000 gallons per minute or 1,000 acre-feet of water annually.

2. Emergency Inter-Ties: City of San Bernardino, 1,000 gpm; City of Rialto, 1,000 gpm and the City of Colton, 1,000 gpm. To date, Riverside Highland Water Company has not received any water from these inter-ties but has delivered water to the City of Rialto and City of Colton.

In addition to the alternative sources in-place at the current time, sources of water, other than additional wells extracting natural in-flow to the water basins include:

- State Project water from the San Bernardino Valley Municipal Water District when water treatment facilities and pipelines are in-place.

- Extraction of State Project Water, which has been percolated into the basin by the San Bernardino Valley Municipal Water District.

- Extractions of Santa Ana River Water which has been percolated into the water basins through the Seven Oaks Accord, if the water rights are proved by the State Department of Water Resources.

- Connection to the Western Municipal Water District "Riverside-Corona Feeder" pipeline project when the pipeline is constructed.

5.10 RECYCLED WATER

The Riverside Highland Water Company does not have a wastewater treatment plant and the two (2) wastewater treatment plants in the immediate area, the City of Colton and City of San Bernardino, conduct secondary treated wastewater to a RIX plant where the wastewater is further treated and discharged into the Santa Ana River downstream from the service area of the Water Company. The treated wastewater is discharged in a section of the Santa Ana River which will allow the higher TDS content of the to be delivered.

The Riverside Highland Water Company is practicing groundwater conservation by extracting water not suitable for domestic purposes (Wells RN-21 and RN-22, high in nitrates) and serving this water to irrigation water customers in-lieu of using domestic water. By removing this tainted water from the basin it is anticipated that the extraction of this water will reduce the level of nitrates in this area of the basin so future use of this water will be conductive to domestic water use.

5.11 REDUCTION OF WATER LOSSES AS A SOURCE OF WATER

The Riverside Highland Water Company has developed a substantial amount of water through its' Capital Replacement Program from 1985 through the present. The water gained by reducing the Unaccounted-For-Water in the domestic water system is shown in Section VI, herein. There were also large losses in the irrigation water system due to leaks and other factors and the irrigation system has been largely abandoned because of urbanization of the agricultural lands. The remaining and new irrigation systems have

been replaced with new piping and pumping systems are in-place and significant savings in irrigation water will be realized in the future.

The following Table 5-10, "Domestic and Irrigation Water Production, 1985 through 2004 and Number of Services", shows the decline in water production and increase in water services.

Table 5-10

Domestic and Irrigation Water Production and Number of Service Connections 1885 through 2004

	Water Production			
Year	**Domestic**	**Irrigation**	**Total**	**Connections**
1985	4,527	6,721	11,249	3,128
1986	3,898	5,671	9,569	3,197
1987	3,238	4,598	7,836	3,242
1988	3,272	4,774	8,046	3,462
1989	4,026	4,800	8,826	3,631
1990	4,197	4,476	8,673	3,722
1991	3,851	4,366	8,217	3,734
1992	3,457	3,824	7,271	3,749
1993	3,558	4,127	7,685	3,750
1994	3,702	4,503	8,205	3,761
1995	3,629	4,073	7,702	3,763
1996	3,844	4,161	8,005	3,700
1997	3,721	4,183	7,904	3,734
1998	3,269	2,502	5,771	3,735
1999	3,921	2,120	6,041	3,736
2000	3,994	1,176	5,170	3,748
2001	3,816	839	4,655	3,780
2002	4,772	1,022	5,793	3,780
2003	3,922	708	4,630	3,782
2004	4,044	501	4,545	3,817

In 1985, the Unaccounted-For-Water in the irrigation system was 45.1 %. The reduction in Unaccounted –For-Water reduced at a slower rate since the reduction of agricultural lands was anticipated through attrition and conversion to urban development. The reduction of losses in the irrigation system has proved to be a source of water, same as the domestic water system. Careful planning and forward thinking by the Riverside Highland Water Company has proved to be a valuable asset in the future of the Water Company.